

phase of it. Mr. R. J. Lunnon and Miss Milne took the photographs. To them and to all the physicians of St. John's Hospital for Diseases of the Skin who allowed us to investigate their patients we are most grateful.

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## OBSERVATIONS ON ACNE, SEBORRHOEA, AND OBESITY

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A survey of 2,720 unselected soldiers was made in order to clarify the natural history of acne and its correlation, if any, with seborrhoea, obesity, and colouring.

*Acne and Seborrhoea.*—Nearly every textbook of dermatology refers to the association between acne and seborrhoea and the need to treat coexistent dandruff, which is taken to be the hallmark of seborrhoeic dermatitis. According to Molesworth (1937), "a certain degree of seborrhoeic dermatitis, at least in the form of a scurfy scalp, is invariable and should be treated simultaneously." Becker and Obermayer (1947) say the same thing and give standard instructions to all patients: "Unless it is otherwise specified, shampoo twice weekly." "Milder degrees of dandruff are almost always present" (Mitchell-Heggs, 1950). Acne is "worse in those who have coarse oily skins and pityriasis of the scalp" (Andrews, 1954). We have found only one attempt (Cohen, 1945b) to verify this belief objectively, but, on the other hand, there has been some speculation on the mechanism of the supposed association. Some writers mention the frequency of acne around the hair margin in cases of dandruff and suggest an infective process. We have not been able to observe this, and the results obtained in our investigation of a large series strongly suggest that there is no relation between the occurrence of dandruff and acne.

*Acne and Weight.*—There is less unanimity concerning the value of diet in the treatment of acne, but most writers recommend the elimination of chocolate and many advise reduction of carbohydrates, fats, and fried foods. Andrews (1954) says that acne is aggravated by "excess of fats, sweets, starchy food in the diet or overeating." Sutton (1941), proposing acne as a "pustular lipoidosis," even suggests that acne is worse in summer, owing partly to "gross increase in oil intake on account of the popularity of ice-cream." Mitchell-Heggs (1950) advises correction of obesity; but MacKenna (1952), while recommending reduction of carbohydrate and fried food, counsels regular weighing to avoid undernourishment.

If such factors do play a part in the aetiology of acne, they would probably be reflected in some degree of obesity; and an association between acne and obesity might be taken to lend support to these or other theories

concerning acne. Our investigation suggests that there may be such an association.

*Acne, Dandruff, and Colouring.*—The association between acne, dandruff, and colouring has received less notice—possibly because there are no obvious therapeutic implications. The general belief appears to be that acne and dandruff are commoner or more severe in dark people. Bloch (1931), in his important paper establishing the correlation between the onset of acne and puberty in 4,191 Swiss children, says "darker pigmented persons are more subject to acne," but he gives no figures. Hinrichsen and Ivy (1938) had 93 negroes in their series of 1,120 American high-school students, and state that acne was commoner in the negro children; severe acne was slightly commoner in negro boys than in white boys, but the girls were about equal. The figures they quote do not strongly support the conclusion. Ormsby and Montgomery (1954) state that comedones are "somewhat more frequent in coarse-skinned brunettes." On the other hand, Cunningham and Lunsford (1931), using the records of 12,530 entrants to the University of California, state that acne and "complexion" are not related; and Lynch (1939) found no connexion between hair colour or texture and acne in the records of 4,235 entrants to Minnesota University. In the present series there is no significant correlation between acne and colouring, but dandruff is commoner in ginger subjects.

### Material

The series consists of 2,720 soldiers aged between 15 and 40 years, each of whom was seen once only at a routine medical examination. All men attending during the period of the investigation are included except for three with psoriasis. The degree of acne was noted in 2,629, and a further 91 men were examined only for the presence or absence of acne. 2,220 of the men were examined for dandruff and colouring. The age distribution is shown in Table I.

The men were examined stripped, in good daylight. Age, height, and weight were recorded and compared with standard tables (Sunderman and Boerner, 1949). Weights were then expressed as the deviation in pounds from normal for the age and height.

*Acne.*—We followed Bloch's classification for recording the severity of acne: nil = no comedones present; grade 1 = comedones only; grade 2 = comedones with a few papules and/or pustules; grade 3 = many comedones, papules, and pustules. Grades 1, 2, and 3 together constitute the "total acne" or "acne in the broadest sense" of other writers. Grades 2 and 3 make up "clinical acne" or "acne in the narrowest sense." The presence of acne on the face, chest, back, and nape of the neck was recorded separately.

*Dandruff.*—Nil = no scales on the scalp—occasional flakes in the hair were ignored; grade 1 = any scales on the scalp, often symptomless; grade 2 = gross dandruff all over the scalp; the patient would usually be aware of it.

*Colouring.*—The range from blond hair to black was divided into groups. A separate group was formed of men with ginger hair. The distribution of the groups is shown in Table V.

### Incidence of Acne

The incidence of acne in this series is shown in Table I. There were 49 men with grade 3 acne. These formed about 3% of each year from 18 to 22; apart from this period, there were three aged 17 and one aged 33 years. Our figures at 18 years are shown in Table II together with those of the comparable series of Bloch (1931), Hinrichsen and Ivy (1938), and Forbes (1946). These all deal with young men and use the same criteria of acne.

TABLE I

Age	No. of Men	Acne			
		Nil	Grade 1	Grades 2-3	Total
15	24	10 (42%)	7 (29%)	7 (29%)	14 (58%)
16	23	5 (22%)	10 (43%)	8 (35%)	18 (78%)
17	258	51 (20%)	82 (31%)	125 (49%)	207 (80%)
18	1,461	160 (11%)	413 (28%)	888 (61%)	1,301 (89%)
19	156	24 (15%)	46 (30%)	86 (55%)	132 (85%)
20	283	52 (18%)	72 (26%)	159 (56%)	231 (82%)
21	252	55 (22%)	69 (27%)	128 (51%)	197 (78%)
22	55	15 (27%)	13 (24%)	27 (49%)	40 (73%)
23	44	18 (41%)	9 (20%)	17 (39%)	26 (59%)
24-29	53	27 (51%)	12 (23%)	14 (26%)	26 (49%)
30-40	20	13 (65%)	4 (20%)	3 (15%)	7 (35%)

TABLE II.—Incidence at 18 Years in Various Series

	Bloch (166 Men)	Hinrichsen and Ivy (? No.)	Forbes (189 Men)	This Series (1,461 Men)
No acne .. ..	0.6%	3%	25%	11%
Grade 1 .. ..	45.2%	24%	27%	28%
Grades 2 and 3 ..	54.2%	73%	48%	61%

TABLE III

Age	No. of Men	Total Acne				Clinical Acne			
		Face	Chest	Back	Neck	Face	Chest	Back	Neck
15-17	305	69%	23%	29%	27%	40%	10%	16%	7%
18-19	1,617	75%	35%	49%	45%	45%	16%	29%	12%
20-40	707	48%	29%	45%	40%	28%	14%	32%	12%

The greatest incidence of acne in our series is at 18 years, but even then we have 11% without any acne, in contrast with 0.6% in Bloch's Swiss subjects or Hinrichsen and Ivy's 3% in the Chicago region. Forbes found 25% with no acne in British soldiers, so that there is probably a true geographical variation.

#### Site of Acne

The incidence of acne at various sites is set out in Table III. It is seen that facial acne is by far the commonest form in the younger groups, until the incidence of acne reaches its peak at the age of 18-19. Thereafter, as facial acne declines most rapidly, the predominant site tends to change to the trunk. Something of this pattern is seen in Cohen's series (1945a) of 500 women. It is to be noted that the rare cases of infantile acne are all on the face (Beatty and Bigger, 1923; Ayres, 1926; Giknis, Hall, and Tolman, 1952).

These facts support the theory, quoted by Goldsmith (1936), that comedone formation and acne are related to rudimentary hair growth in immature pilosebaceous complexes, following endocrine stimulation; and that acne dies out when the hair is well established, as on the beard area.

#### Acne and Dandruff

Table IV shows that the incidence and severity of acne is the same in men with and without dandruff. We have found only one report (Cohen, 1945b) of an investigation into the association between acne and dandruff. Cohen, in 500 women, found no significant correlation apart from

TABLE IV (2,220 men)

Acne	Dandruff		
	None (1,251 Men)	Grade 1 (901 Men)	Grade 2 (68 Men)
None .. ..	199 (15.9%)	156 (17.3%)	14 (20.6%)
Grade 1 .. ..	328 (26.3%)	240 (26.6%)	13 (19.1%)
.. 2 .. ..	698 (55.7%)	484 (53.8%)	39 (57.4%)
.. 3 .. ..	26 (2.1%)	21 (2.3%)	2 (2.9%)

an increase of "total acne" of the chin (as distinct from the face) in subjects with "gross dandruff." Lynch (1939), reporting a series of American University entrants, states that seborrhoea is increased in acne but gives no definitions or figures.

The presence of any degree of acne is unrelated to the presence or the severity of dandruff. It is seen that the entire series contains only two men with both severe dandruff and severe acne—exactly as would occur by chance, in view of the separate incidence of each.

If dandruff does aggravate acne the effect would almost certainly have been evident in this large series. It is possible that treating dandruff may improve some cases of acne; but this seems unlikely, and a controlled therapeutic test is desirable to justify the considerable effort expended in the treatment of pityriasis capitis at present.

#### Colouring

The incidence of acne and dandruff in the different groups is shown in Table V. It is not possible to assess the significance of the high incidence of acne in blond men, because there were only 14 in this group. There is no significant

TABLE V

	Total Acne		Dandruff	
	No.	%	No.	%
Blond (14 men) ..	13	92	4	29
Light brown (877 men) ..	744	85	385	44
Dark " (1,081 " ) ..	893	82	463	42
Black (66 men) ..	51	77	27	41
Ginger (31 " ) ..	27	87	21	68

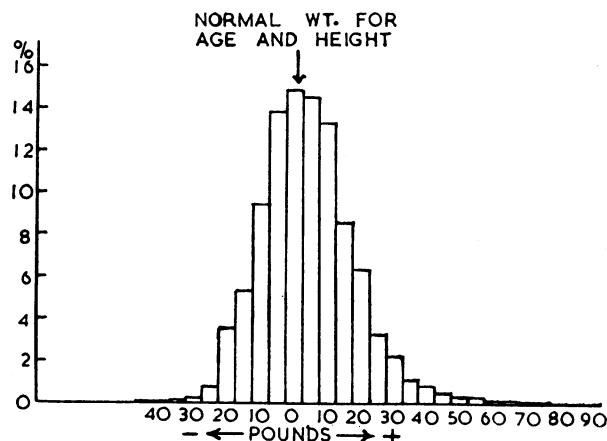


FIG. 1.—Weight distribution in the series of 2,720 men.

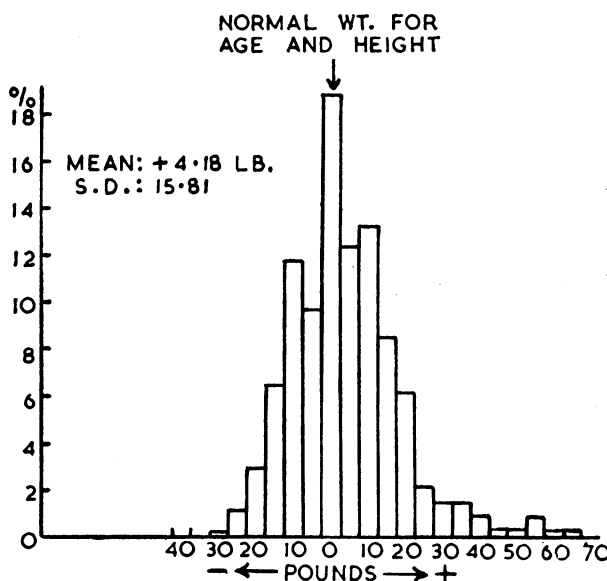


FIG. 2.—Weight distribution in 339 males aged 15-19 with no acne.

variation in the incidence of acne in the other groups. There is no significant variation in the incidence of dandruff in the complexion gradings blond to black, but the increased number of ginger subjects with dandruff is significant at the 5% level.

#### Acne and Weight

Fig. 1 shows the distribution of overweight and underweight subjects in 2,720 men. The men were divided into

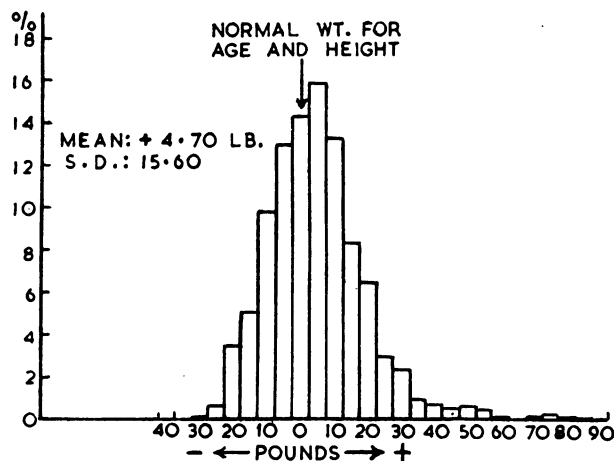


Fig. 3.—Weight distribution in 1,686 males aged 15-19 with acne.

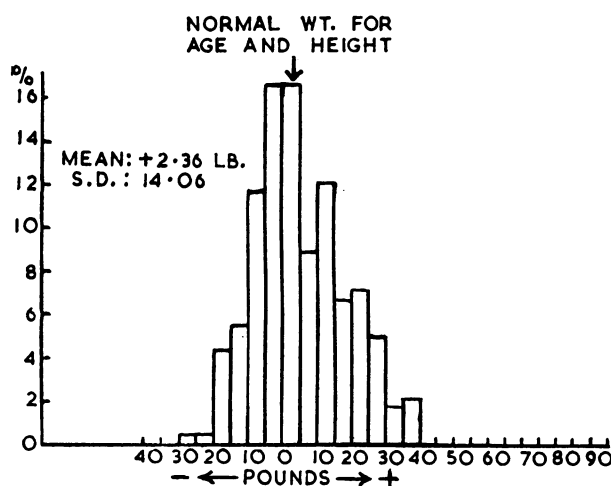


Fig. 4.—Weight distribution in 180 males aged 20-40 with no acne.

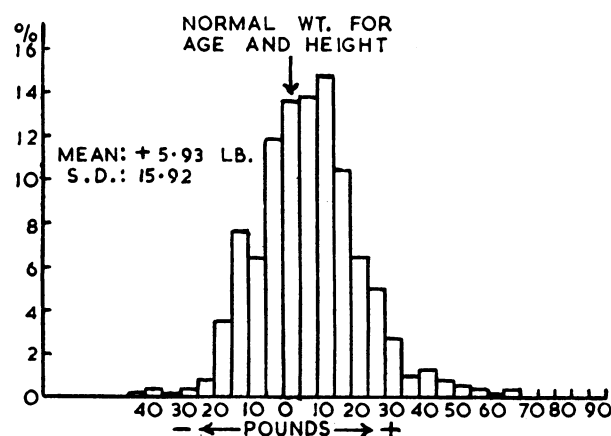


Fig. 5.—Weight distribution in 515 males aged 20-40 with acne.

two groups, aged 15-19 and 20-40 years. Figs. 2-5 show the weight distribution in men with and without acne, in each of these groups. We find no simple relation between any grade of acne and weight at any age, and in the younger group there is no relation at all between acne and weight; the distribution curves for the younger age group do not differ significantly. These findings conform to those of Lynch (1939) and Cunningham and Lunsford (1931), who studied the records of entrants to American universities.

Among men over 20 years those with acne tend to be heavier; the reason is as yet unknown. In this older group, subjects with acne have a modal weight 10 lb. (4.5 kg.) above the standard normal; the modal weight of those with no acne is 2½ lb. (1.14 kg.) below the normal. The difference between the two mean weights is significant at the 1.25% level.

It remains to be investigated objectively whether any dietary regime, with or without weight reduction, improves clinical acne at any age.

#### Summary and Conclusions

The incidence, site, and severity of acne in 2,720 soldiers are described, and correlated with colouring and the degree of obesity and dandruff.

The incidence and severity of acne are the same in men with all grades of dandruff. The value of shampoos in the management of acne is doubtful.

Acne is equally common in fair, dark, and ginger subjects. Dandruff is commoner in ginger men than in others.

Most acne occurs at 18-19 years, and the face is then by far the commonest site. Thereafter it disappears from the face most rapidly and the trunk tends to become the predominant site in older men. Acne may be related to rudimentary hair-growth and dies out where hair-growth is well established.

During adolescence acne is not related to obesity; but men over the age of 20 with acne tend to be heavier than those without it.

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